Name:

at1121exam_practice: Radicals and Squares (v609)

Question 1

Simplify the radical expressions.

$\sqrt{63}$ $\sqrt{45}$ $\sqrt{18}$

$\sqrt{3 \cdot 3 \cdot 7}$ $\sqrt{3 \cdot 3 \cdot 5}$ $\sqrt{3 \cdot 3 \cdot 2}$

$3\sqrt{7}$ $3\sqrt{5}$ $3\sqrt{2}$

Question 2

Find all solutions to the equation below:

$$\frac{(x+6)^2 - 4}{3} = 4$$

First, multiply both sides by 3.

$$(x+6)^2 - 4 = 12$$

Then, add 4 to both sides.

$$(x+6)^2 = 16$$

Undo the squaring. Remember the plus-minus symbol.

$$x + 6 = \pm 4$$

Subtract 6 from both sides.

$$x = -6 \pm 4$$

So the two solutions are $x = -2$ and $x = -10$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 18x = 88$$

$$x^2 - 18x + 81 = 88 + 81$$
$$x^2 - 18x + 81 = 169$$
$$(x - 9)^2 = 169$$
$$x - 9 = \pm 13$$
$$x = 9 \pm 13$$
$$x = 22 \quad \text{or} \quad x = -4$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 - 24x + 68$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 - 12x) + 68$$

We want a perfect square. Halve -12 and square the result to get 36 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 - 12x + 36 - 36) + 68$$

Factor the perfect-square trinomial.

$$y = 2((x - 6)^2 - 36) + 68$$

Distribute the 2.

$$y = 2(x - 6)^2 - 72 + 68$$

Combine the constants to get **vertex form**:

$$y = 2(x - 6)^2 - 4$$

The vertex is at point $(6, -4)$.